Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1-12. (Canceled)

13. (Currently Amended) A single lumen microcatheter, comprising:

an elongate shaft having a distal end and a proximal end, the elongate shaft having an outer surface and an inner surface, the inner surface defining a single lumen extending from the proximal end to the distal end of ~~through~~ the elongate shaft and fluidly ~~connected~~ connecting the proximal end to an opening at the distal end of the elongate shaft;

an elongate guidewire port positioned proximal of the distal end of the elongate shaft, the elongate guidewire port extending from the inner surface of the elongate shaft to the outer surface of the elongate shaft; and

a polymer sheath disposed over the elongate guidewire port, the polymer sheath having an inner surface and an outer surface, the polymer sheath having a length measured from a proximal end of the polymer sheath to a distal end of the polymer sheath, the polymer sheath including a passage comprising an angled slit extending radially through the polymer sheath at an angle such that the slit has a depth that is greater than a thickness of the polymer sheath, the slit disposed parallel to a longitudinal axis of the elongate shaft, the slit having a length measured parallel to the length of the polymer sheath and parallel to the longitudinal axis of the elongate shaft, the length of the slit being less than the length of the polymer sheath such that the slit extends along only a portion of the length of the polymer sheath, the passage in communication with the elongate guidewire port, wherein the passage is configured to permit guidewire access through the elongate guidewire port while remaining substantially fluid tight in use when no guidewire is provided through the passage; and

wherein when no guidewire is provided through the passage, the single lumen is substantially fluid tight from the proximal end of the elongate shaft to the opening at the distal end of the elongate shaft.

14. (Cancelled)

15. (Previously Presented) The single lumen microcatheter of claim 13, wherein the angled slit extends radially through the polymer sheath at an angle substantially less than 90 degrees to the outer surface of the polymer sheath.

16. (Previously Presented) The single lumen microcatheter of claim 13, wherein the angled slit extends from the outer surface of the polymer sheath to the inner surface of the polymer sheath.

17. (Previously Presented) The single lumen microcatheter of claim 13, wherein the angled slit is configured to accept both a guidewire and a sheath wherein the sheath is configured to accept the guidewire therein.

18. (Original) A method of delivering a therapeutic element through a single lumen microcatheter, the single lumen microcatheter comprising an elongate shaft, a guidewire port, and a control valve disposed proximate the guidewire port, the method comprising:

advancing a guidewire sheath through the control valve and through the guidewire port;

advancing a guidewire through the guidewire sheath;

advancing the microcatheter over the guidewire to a treatment site;

removing the guidewire and the guidewire sheath, thereby closing the guidewire port; and

advancing the therapeutic element through the shaft, past the closed guidewire port, to the treatment site.

19. (Original) The method of claim 18, wherein the therapeutic element comprises embolic fluid.

20. (Original) The method of claim 18, wherein the therapeutic element comprises a mechanical device selected from the group consisting of stents, embolic coils, or other embolic material.

21. (Previously Presented) The single lumen microcatheter of claim 13 wherein the guidewire port has a length and a width, wherein the length is at least three times greater than the width.

22. (Previously Presented) The single lumen microcatheter of claim 21, wherein the length is at least six times greater than the width.

23. (Previously Presented) The single lumen microcatheter of claim 21, wherein the guidewire port has a first wall and a second wall, wherein the first wall and the second wall extend parallel to the longitudinal axis of the elongate shaft and wherein the guidewire port length also extends parallel to the longitudinal axis of the elongate shaft.

24. (Previously Presented) The single lumen microcatheter of claim 13, wherein the slit has a length greater than the length of the guidewire port.

25. (Previously Presented) The single lumen microcatheter of claim 13, wherein the guidewire port is defined by a perimeter wall having sides that tapers inward such that the perimeter of a top edge of the guidewire port is greater than the perimeter of a bottom edge of the guidewire port.

26. (Previously Presented) The single lumen microcatheter of claim 25, wherein the sides are angled at approximately a 45-degree angle.

27. (Previously Presented) A microcatheter, comprising:

an elongate shaft having a distal end and a proximal end, the elongate shaft having an annular wall defining an outer surface and an inner surface of the elongate shaft, the inner surface defining a lumen extending through the elongate shaft fluidly connected to an opening at the distal end of the elongate shaft;

an elongate guidewire port positioned proximal of the distal end of the elongate shaft, the elongate guidewire port extending through the annular wall of the elongate shaft from the inner surface of the elongate shaft to the outer surface of the elongate shaft; and

a polymer sheath disposed over the elongate guidewire port, the polymer sheath having a wall defining an inner surface and an outer surface of the polymer sheath, the wall having a thickness measured from the inner surface to the outer surface of the polymer sheath, the polymer sheath including a passage comprising an angled slit extending radially through the wall of the polymer sheath from the outer surface to the inner surface of the polymer sheath, the angled slit extending at an angle such that the slit has a depth measured from the inner surface to the outer surface of the polymer sheath that is greater than the thickness of the wall of the polymer sheath, the slit disposed parallel to a longitudinal axis of the elongate shaft, the slit being defined between a first edge of the polymer sheath and a second edge of the polymer sheath facing the first edge, each of the first edge and the second edge extending from the outer surface to the inner surface of the polymer sheath, wherein the first edge and the second edge are in contact with each other when no guidewire is extended through the passage, the passage in communication with the elongate guidewire port, wherein the passage is configured to permit guidewire access through the elongate guidewire port while remaining substantially fluid tight in use when no guidewire is provided through the passage.

28. (Previously Presented) The microcatheter of claim 27, wherein the angled slit extends radially through the polymer sheath at an angle substantially less than 90 degrees to the outer surface of the polymer sheath.